

Final Report

Charlotte 2nd Draft Unified Development Ordinance Economic and Design Analysis

The Economics of Land Use



Prepared for:
City of Charlotte

Prepared by:
Economic & Planning Systems, Inc.

with support from Perkins&Will

EPS #213049

June 20, 2022

*Economic & Planning Systems, Inc.
730 17th Street, Suite 630
Denver, CO 80202-3511
303 623 3557 tel
303 623 9049 fax*

*Denver
Los Angeles
Oakland
Sacramento*

www.epsys.com

Table of Contents

1.	Purpose and Summary of Findings	1
	Study Purpose	1
	Updated Major Findings	1
	Updated Specific Cross-Cutting Concerns	5
2.	Neighborhood 1	9
	Sidewall Height Limit	9
	Conservation Residential Development Threshold	11
	Restriction on Residential Driveways and Parking	12
3.	Activity Centers/Neighborhood 2	16
	Open Space and Green Area Requirements	16
	EV Charging Requirements	18
	Neighborhood 1 Height Transition	21
4.	Affordable Housing	23
	Zoning District Flexibility	23
	Conservation Residential Development	24
	Fees in Lieu	24
	Height Bonuses for Affordable Units	25
5.	Employment	26
	Industrial Block Lengths	26
6.	Other Issues and Considerations	27
	Heritage Trees	27

List of Tables

Table 1	Place Type Specific Issues Tracking	8
Table 2	Small Sized, Interior Lots Project Impacts	14
Table 3	EV Charging Requirement 1 st and 2 nd Draft Impacts	20

List of Figures

Figure 1	Draft UDO Housing Capacity Estimated Increase	3
Figure 2	Windwood Circle Duplex vs SFD Project Value	10
Figure 3	2 nd Draft UDO Sidewall Height Illustration.....	11
Figure 4	Duplex Split Front Access Diagram	15
Figure 5	Draft UDO Required EV Charging Stations	19

1. Purpose and Summary of Findings

Study Purpose

This study was commissioned by the City of Charlotte with the support of stakeholders in the real estate development industry to evaluate the potential economic impacts of the draft Unified Development Ordinance (UDO). The City of Charlotte released a 1st Draft of the UDO in October of 2021. EPS completed an economic analysis of the impact of provisions of the draft on development feasibility and growth potential for the city. Based partly on the initial analysis completed, and from feedback gained through the city's review and comment process, the City has developed a 2nd Draft of the UDO in May of 2022. This 2nd Draft serves the public review draft prior to council consideration for adoption of the UPO. This report provides an analysis of the changes made between the 1st and 2nd drafts and the resulting impacts on the initial study findings.

To evaluate the draft UDO, two analyses were completed in concert.

- **Design Analysis** – Perkins&Will performed a design analysis that models the physical outcomes of the draft UDO ordinances. The findings of that analysis are summarized in a separate report.
- **Economic Analysis** – Economic & Planning Systems performed an economic analysis that identifies the impacts related to development feasibility issues and cost outcomes of the UDO.

The two analyses were developed to identify and consider refinements to the draft UDO prior to adoption based on their impacts to development feasibility.

Updated Major Findings

The findings of the design and economic analysis were organized within three categories: process outcomes, design findings, and economic analysis findings.

Process Outcomes

The analysis process created value to the City and the UDO process beyond the specific findings. The process allowed for a robust and in-depth conversation to occur between the City and the development community that helped to build buy-in for the UDO. The beneficial outcomes include:

- A comprehensive tracking of comments and questions from stakeholders.
- Transparency of outcomes from issues raised.

- Continued evaluation of actionable changes that may occur within the implementation of the UDO after adoption.
- Increased clarity of language in the UDO.
- Expanded flexibility in several ordinance topic areas including open space implementation, green area implementation, and development bonuses.
- Confirmation that the desired built form and project yield/intensity can be achieved.
- Identification and resolution of several unintended outcomes.
- Recommended changes to 1st Draft UDO to address impacts identified through the process.

High-Level Analysis Findings

The findings provided below are based on the 1st Draft release of the UDO in October 2021 and the subsequent changes made in the 2nd Draft released in May 2022. The changes made within the 2nd Draft UDO have reduced potential negative impacts on development feasibility and development capacity identified in the 1st Draft.

Economic Analysis Findings

The economic analysis identified the following high-level impacts.

- 1. The 2nd Draft UDO is likely to lead to more development occurring by right after the initial alignment rezoning and community area planning process, which will decrease the number of projects needing rezoning or condition zoning.***

This change will decrease cost and the development period for projects. The draft UDO has three review types of projects: projects built by-right, by-right projects built with prescribed conditions, and projects requiring a rezoning. This approach should mitigate needs for project-specific conditional zoning or rezonings. Many of the base UDO standards are anticipated to address items typically added through negotiations in the conditional rezoning process. EPS reviewed the zoning designation for 115 multifamily apartment projects built between 2018 and 2021 in Charlotte. Over 40 percent of these projects were approved and built with a conditional zoning designation. It is likely that an additional amount of these projects required a rezoning to conventional district (i.e., no conditions). This is consistent with the feedback that the stakeholders provided. The Design Analysis found that all the actual case study projects evaluated could be built under the draft UDO without additional variances or conditions beyond those needed for the original project.

2. The 2nd Draft UDO has the potential to generate greater development potential than the current ordinance, which will increase the potential economic value of development within the city and provide greater capacity for growth.

The increased amount of development capacity from the 2nd Draft UDO varies by development context/place type. The most substantial change in the Neighborhood 1 place type is the allowance of duplexes and triplexes on any formerly single family only lot in the city. EPS estimates that 7 percent of existing single family lots in the city have a high likelihood for redevelopment from one unit to two or three. Redevelopment of these lots could result in 9,000 to 10,000 additional attached units. For perspective, the Community Viz model used to evaluate the City’s Future Place Type Map estimated 20,400 new attached units will be built by 2040 (not factoring in this allowance) and the city has capacity for 26,100 units. This change has the potential to increase capacity for attached units by 29 percent. Furthermore, the ability to provide two units instead of one unit on a parcel will entice the construction of two units, which due to the UDO design regulations result in smaller and less expensive units.

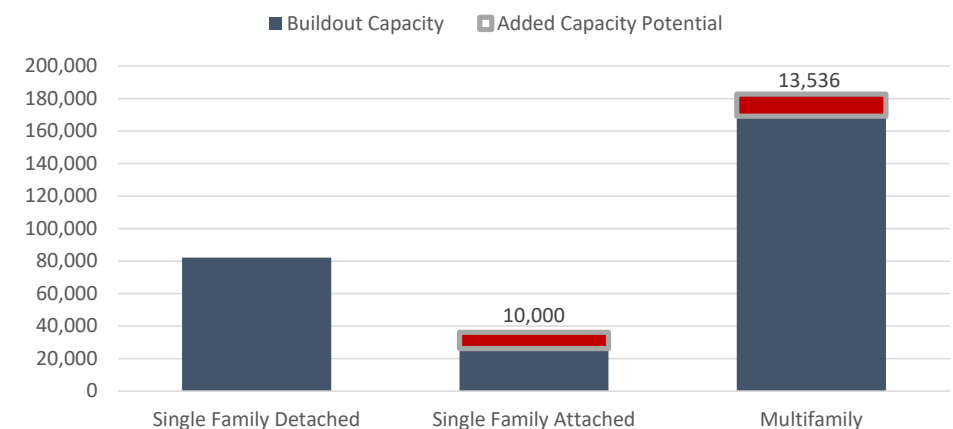
The design analysis found that for the actual project sites evaluated in the Activity Centers and Neighborhood 2 zoning districts the potential to generate 8 percent greater development capacity (average of all three projects) if built to the maximum allowance of the district and assuming the market supports the additional development. For a prototypical urban apartment project that equates to an increase of 22 units, a \$660,000 increase in project returns, and a 7 percent decrease in residual land cost per unit. The required rental rate for a unit

decreased by approx. \$10 per month for returns to match.

The Community Viz model estimated that the capacity for multifamily units in the city based on the Policy Map is 183,000. An 8

percent increase results in an additional capacity of 13,536 units.

Figure 1 Draft UDO Housing Capacity Estimated Increase



A new provision added to the 2nd Draft UDO requires a height transition for development adjacent to Neighborhood 1 place types. This transition limits building heights to 50’ (i.e., four stories) for the first 100 feet from a property in the N1 place type. EPS estimates that this new provision will impact

capacity on sites adjacent to N1 areas. EPS estimates that the provision will decrease development potential by approximately 2,000 multifamily units. This decrease in potential negates a portion of the added capacity estimated in **Figure 1** but does not hinder development on these parcels or negate the overall finding that the UDO will increase development potential.

3. The level of investment in projects required by the 2nd Draft UDO in most cases will continue to increase however the impacts are less than the provisions in the 1st Draft. The 2nd Draft has improved standards regarding heritage trees, open space and green areas, electric charging, and design flexibility.

The level of increased investment for projects (i.e., costs) were less than 2 or 3 percent for most of the items evaluated in the 1st Draft review. The cost increases from each new requirement are not uniform across all project types. For context, a 1 percent increase in project cost results in an increase in required rent per month of \$10 to \$15 for an apartment to match returns for a project. As shown above, the draft UDO is estimated to increase capacity for development on project sites. The increased yield can offset increased costs associated with the UDO. As well, development process improvements (e.g., more by-right development, new UDO administrator) will also impact the cost of development by decreasing the length and requirements of the approval process.

In addition, the 2nd Draft UDO requires projects to provide community amenities (e.g., greater open spaces/green area requirements, greater protections for trees and natural areas, more multimodal improvements) and match the desired built form for the community prescribed in the Charlotte Future 2040 Comprehensive Plan. The value of these benefits being provided in a more uniform manor will have additional economic benefits (e.g., attractiveness of the community increasing demand and attraction of investment/companies) that could not be quantified in this study. The 2nd Draft UDO will provide a more consistent application of infrastructure and community amenities without the need for negotiations with City staff, City Council, and the community through conditional rezoning approvals.

Specific improvements to standards that were impacting development yield and/or cost are identified below in this report.

Updated Specific Cross-Cutting Concerns

The following issues impact the ability to develop projects in Charlotte and require continued evaluation and modifications through implementation of the UDO to achieve the outcomes described above.

- **Impact on Small Projects:** The 2nd Draft UDO provides a more consistent approach to requirements for all development projects, which results in increased investment from the developer. These increased investment requirements are likely to be more impactful on small projects. A growing share of new development in Charlotte will be on infill and redevelopment sites (estimated to be 56 percent of development capacity in the city) that have an average size of less than 1.5 acres. This is in comparison to the undeveloped parcels in the city that have an average size of 9.7 acres. Specific issues were identified in the 1st Draft review that were estimated to have a greater impact on smaller projects are identified in the project-specific issues including requirements related to site access for duplex/triplexes/quadplexes, post construction storm water, building/sidewall heights, and thresholds for use of conservation subdivision standards. Many of these issues were addressed and improved in the 2nd Draft that have reduced potential burdens on smaller projects. Greater flexibility for addressing new requirements for smaller projects (under 5 acres) should be explored as issues arise once the UDO is adopted.
- **Tree Preservation and Heritage Trees:** The 1st Draft UDO included a requirement for any heritage tree (defined as a tree native to North Carolina with a DBH of 30 inches or greater) to not be impacted unless certain conditions exist. As written in the 1st Draft of the UDO, a heritage tree cannot be removed in many circumstances. The presence of a heritage tree on a site, especially located in the middle portion of the site, in many cases would prevent development.

The 2nd Draft UDO was modified to reduce the impact of the Heritage Tree provisions while trying to maintain the outcomes of tree preservation. The 2nd Draft now allows for removal of heritage trees if tree location imposes a documented conflict on placement of a structure or the tree imposes an unreasonable restriction on the use of the property. The need to document heritage trees will increase the need to conduct tree surveys of properties and will increase cost (which was the case in 1st Draft). The need to mitigate removal of Heritage Trees will also increase cost. However, the provision is no longer likely to prevent development due to the requirement.

The intent of the ordinance is to protect the city's tree canopy, which has been diminishing. Each development site will have widely varying impacts from heritage trees and other tree requirements. If known, the cost of replanting

trees and paying mitigation payments can be navigated and accommodated in many cases. However, the needs on each site, especially heavily wooded sites, are unknown without a tree survey. The cost of a tree survey will vary by site size and number of trees but is a needed step in pre-development planning. In most cases, a developer is considering buying or developing a property prior to obtaining financing for the development project. The changes to the 2nd Draft now provide options for mitigating impacts of Heritage Trees on properties, which addresses the primary concern of the provision. Also, more specific language was added regarding the impact of trees on adjacent properties to state that the critical root structure of a tree on an adjacent property does not require mitigation.

- **Area Overlap:** The draft UDO requires development projects in many contexts to provide both usable open space, landscape yards, and green area, which includes tree save, stormwater buffers, and other approaches to address tree canopy and environmental goals. These requirements were additive in most cases in the 1st Draft. An impactful recommendation developed in the project process was the allowance for some types (specified later in the report) of these open spaces areas to overlap with green areas when certain conditions and requirements of both standards are met. Changes within the 2nd Draft UDO created more flexibility and overlap. Specifically, the 2nd Draft removed and reduced a minimum width and length requirements for open space and provided the opportunity for payment or dedication of land in lieu of providing open space. The 2nd Draft also allowed for greater overlapping of Open Space areas and Green Areas, allowing for 50% of open space to count towards the tree save area provisions. As well, there are greater allowances for what types of areas can count towards a project's Tree Save Area or Amenitized Tree Area.
- **Building Heights:** The building height allowances have a major impact on potential yield of site. The 2nd Draft UDO introduced a new limitation on height that was not in the 1st Draft UDO. Parcels adjacent to parcels in the Neighborhood 1 Place Type are now subject to a height transition provision. Portions of a parcel within 100' of a N1 parcel are limited to 50' feet in height (was 65' in 1st Draft). This provision reduces the potential height of a building from five stories to four within the 100' buffer.

EPS evaluated the potential development parcels that intersect with the 100' buffer. The analysis identified that approximately 4,000 potential development parcels that intersect the buffer. Eighteen percent (18%) of the acreage in these 4,000 parcels falls within the 100' buffer. EPS estimated that height limitation would decrease the total capacity for multifamily units on these parcels by 4% in aggregate, equivalent to 1,833 units. This reduction does decrease development capacity in the city but not substantially. The provision will also impact development feasibility for parcels subject to the buffer. An average multifamily project is estimated to see at most an 8% reduction in the number of units, which will reduce project returns but not create development

feasibility barriers for a typical project. The provision generates uneven impacts on the 4,000 potential development parcels identified.

- **Emerging Technologies:** The 1st Draft UDO has several new provisions that attempt to provide progressive strategies for inclusion of emerging technologies for building construction and mobility. The continued updating of the UDO to facilitate the use of emerging technologies is needed after adoption. One of the key issues identified related to this topic is the requirement for parking lots and garages for selected uses to be equipped with a specified share of spaces that have electric charging stations or are pre-wired for electric charging. The 1st Draft UDO requirements call for a substantial portion of spaces to be pre-wired, which can have significant cost impacts on development. The provision of electric charging is a community benefit; however, the continued changes of charging requirements and equipment are uncertain. The 2nd Draft UDO has reduced the percentage of spaces that need to be capable to support a charging station and provided development bonuses for providing EV spaces. These reductions and bonus provisions will reduce the impacts from the 1st Draft, but it is unclear if the requirement EV capable is in line with future demand. The UDO staff should partner with real estate groups such as REBIC and the Apartment Association to monitor changing demands for EV spaces over time.

Project Specific Findings

Place Type Specific Issues

The following issues were identified by the specific place type focus groups and are unique to that place type (**Table 1**). For each issue, a brief description of the change, the type of impact (Yield – the size of project (units or square feet) allowable, Cost – the cost of developing the project), and the action that the City of Charlotte took in the 2nd Draft of the UDO is provided.

Table 1 Place Type Specific Issues Tracking

Issue	Description	Type	Action	Action Description
Neighborhood 1				
Sidewall requirement for duplex/triplex	12' sidewalk height limit at setback	Yield	Updated	Now 20' sidewalk height is allowed
R8 Zone District Translation	R8 zone district translates to N1-D which is more restrictive than the current R8 district in terms of duplex/triplex/quadplexes	Yield	No Action	
Front Access and Parking	A single access point is required with parking to be accessed on the side or rear of parcel for duplexes/triplexes.	Yield	Updated	Greater flexibility for access points provided
Stormwater improvement threshold	Threshold for triggering stormwater requirements reduced from 20,000 to 5,000 sf of built upon area	Yield/Cost	Continued Review	To be addressed in Stormwater Manual on Approaches to Small Sites
Heritage Trees	Buffer around heritage trees is 30', which must be kept or mitigation options are provided if trees impact greater than 50% of parcel	Yield/Cost	Updated	Trees can be removed if documented impact proven and mitigation measures met
Conservation Residential Development	The threshold for use of a conservation district subdivision is 10 acres. It is 2 acres currently	Yield	Updated	Threshold is now 2 acres.
Affordable Housing				
Zone District Options	Affordable projects can have flexibility of which zone district to use to build a project without requiring a rezoning. Example using N2-B in a NC district.	Cost	Updated	Qualifying projects have greater flexibility within the zone districts in the N2 and NC place types
Expedited Review Process	Can affordable projects have an expedited review process?	Cost	Continued Review	Non-UDO issue
Conservation Residential Development	Conservation residential development may not be used within a voluntary mixed-income residential development.	Yield	Update	Not modified in 2nd Draft due to oversight. To be allowed within final adopted draft.
Activity Centers/Neighborhood 2				
Open space requirements	The additive open space requirements can be too cumbersome to accommodate on sites	Yield	Updated	Greater opportunity for overlapping of open space with Green Area was created. Fee in lieu of open space option added as well.
Heritage Trees	Buffer around heritage trees is 30', which must be kept or mitigation options are provided if trees impact greater than 50% of parcel	Yield/Cost	Updated	Trees can be removed if documented impact proven and mitigation measures met
Front setbacks based on Street Maps	Setbacks for certain projects or areas have significant impact on buildable area	Yield	Updated	Greater flexibility was provided based on street context
EV Charging	Required for MF, Hotels, and mixed use with residential, or principal use is a parking garage	Cost	Updated	Requirement of 10% EV Ready spaces eliminated (20% for capable remains). Bonuses added for providing EV spaces.
Employment				
Industrial Building and Block Lengths	Current 800' preferred block length and 1,500' maximum block length	Yield	Updated	Preferred Block length is now 1,500' and Maximum is 2,000'
Heritage Trees	Buffer around heritage trees is 30', which must be kept or mitigation options are provided if trees impact greater than 50% of parcel	Yield/Cost	Updated	Trees can be removed if documented impact proven and mitigation measures met
Open space requirements	The additive open space requirements can be too cumbersome to accommodate on sites	Yield	Updated	Greater opportunity for overlapping of open space with Green Area was created. Fee in lieu of open space option added as well.
Adaptive Reuse				
Parking requirements	Parking requirements are limiting for reuse, especially from industrial	Yield	Updated	Updates were made to the overall parking requirements
Building Preservation	Can there be addition flexibility to design standards if the building is being preserved and has historic value?	Yield/Cost	Continued Review	No specific recommendations have been identified
Change of Use Triggers	Changing use triggers requirements even without a building modification.	Yield/Cost	Updated	
Comprehensive Threshold/Trigger Matrix	Can the UDO have a single table that shows the various triggers or thresholds that require improvements for existing buildings?	Yield/Cost	Continued Review	Potential addition to UDO guidelines and manuals

Source: Economic & Planning Systems

2. Neighborhood 1

There were four main issues in the 1st Draft found within the Neighborhood 1 place type identified during the process. A description of the issues and measurement of the impact are described below. In addition, several other considerations and clarifications were discussed. Notable considerations and clarifications are also provided.

Sidewall Height Limit

Potential Issue

The 1st Draft UDO restricted the sidewall heights at the side setback for duplexes and triplexes in N-1 zone districts to 12' or the average height of the adjacent sidewalls (whichever is greater).

Reference: Sub-section 4.3.D.1.a

The 1st Draft would have significantly limited the possibility of two-story infill in numerous areas. The 12-foot restriction made the construction of duplexes and triplexes on smaller lots difficult because restricted buildings to one story for a sizable portion of the lot. This was especially true in zone districts that have lot width minimums under 70 feet as there is less room to fit a two-story duplex with the sidewall restriction. Lots with smaller widths are more typically found the more central and older neighborhoods of Charlotte.

The intent of the height limit was to prevent new duplex or triplex units being built that are taller than the existing home(s) they are adjacent to. The limitation at the side setback increases the further from the setback you get to gradually allow for additional height. The concern is tall duplexes or triplexes, which can reach between 40 to 46 feet in height in N-1 district, would create significant shadowing issues, and change the neighborhood character.

Estimated Impact

The sidewall limitations impact the potential yield of new housing units in Charlotte and impacts housing costs. The Windwood Circle project site was used to illustrate the impacts on project values and housing prices of the limitation. The project that converted two homes (on two lots) to three homes (three lots) resulted in a project value of just over \$3 million. This means each home was sold for just over \$1 million. If a duplex could be built instead of one home, the developer has the potential to create a project that has greater value (\$3.2 million vs. \$3 million), as illustrated in **Figure 2**. At the same time, the price points for units sold in in the project will be significantly different. If sold as single-family homes, the price point is estimated to be just over \$1 million for

each unit as described above. However, duplex units are estimated to be sold for \$550,000. This allowance for duplexes allows for the property owner/developer to generate more value in the project while producing units for a lower price.

Figure 2 Windwood Circle Duplex vs SFD Project Value

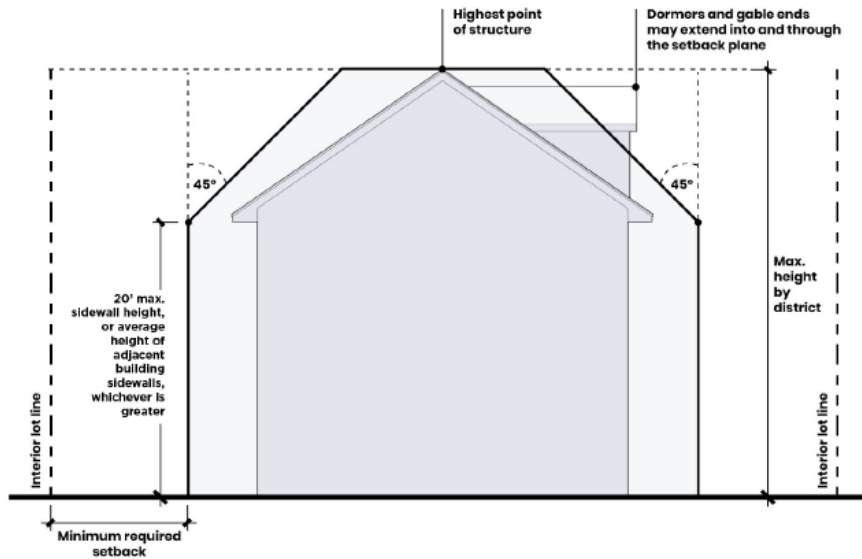


Outcome

Updated – The 2nd Draft UDO now as the 20’ as the maximum sidewall height at the side setback, as shown in **Figure 3**.

Figure 3 2nd Draft UDO Sidewall Height Illustration

BUILDING HEIGHT SETBACK PLANE [\(DUPLEX AND TRIPLEX\)](#) Updated diagram



Conservation Residential Development Threshold

Potential Issue

The 1st and 2nd Drafts of the UDO provide alternative development options within the Neighborhood 1 districts. One of these alternative development options is the use of a “Conservation Residential Development.” A conservation residential development allows for a reduction in lot sizes in exchange for providing open space above the required amount. This option allows for narrow and smaller lots which provides more flexibility for development design especially for greenfield and larger infill projects.

Reference: Sub-section 4.5 A

The cluster residential development approach exists currently in development regulations and accomplishes similar objectives. A major difference with the conservation approach in the 1st Draft UDO and the cluster approach in the current Zoning Ordinance is the threshold for use of the conservation residential development alternative is a subdivision of 10 acres. The threshold is currently 2 acres for the cluster approach.

One of the most prevalent zoning districts in the city is R-3, which requires a minimum lot size of 10,000 square feet and lot frontage of 70 feet. The translation of this district in the draft UDO is to N-1A, which has the same lot size

and frontage requirements. This lot size and frontage size is consistent with a sizable portion of existing single family lots in the city, however this size of lot is much larger and wider than lots being created for new single-family developments in the city. Many newer single-family projects in R-3 districts have been using the cluster alternative to create smaller lots with less front width. Newer developments have been using 40-to-60-foot lot widths.

Estimated Impact

The 10-acre requirement would limit the use of the conservation residential development option. As illustrated in the 1st Draft UDO Economic Analysis Report, the average lot size for potential development projects in the Neighborhood 1 place type is 1.4 acres and most parcels are less than 10 acres in size. The flexibility to use the conservation approach for sites 2 acres in size will help increase potential yield and will allow for projects that more effectively provides open space.

Outcome

Updated – The threshold of 10 acres is reduced to 2 acres in the 2nd Draft UDO.

Restriction on Residential Driveways and Parking

Potential Issue

The 1st Draft UDO limited lots containing a single family, duplex, triplex, and quadraplex dwellings to one driveway per street frontage. This requirement limited lots with four or less units to have access to be consolidated to one location per street frontage.

Coupled with the restriction of access points for lots with one to four units, was the requirement that any duplex, triplex, and quadraplex to not be able to provide parking pads or parking areas in the front setback. The result is that duplexes, triplexes, and quadraplexes will have to provide parking for units on the side or rear of the units accessed via common drive.

Reference: Sub-section 32.3.H and 19.6.A1

These two requirements were intended to limit the number of curb cuts on a street while still allowing more yield/density in neighborhoods to occur. The limitation of parking in the front setback is also meant to address the pedestrian environment and character of the neighborhood.

Estimated Impact

These requirements have subtle impacts on the potential yield of development due to the need to accommodate shared parking access to side or rear parking areas. It is important to note that other provisions of the 1st and 2nd Drafts of the UDO are designed to allow for more middle density housing throughout the city including the allowance of duplexes and triplexes on all Neighborhood 1 place types. These provisions are meant to help guide and shape the impacts of this increase allowance of middle density.

The impacts of these 1st Draft requirements fall on small projects (less than 2 acres) without an alley or two street frontages (e.g., interior lots). The requirements do not prevent the development of duplexes, triplexes, or quadraplexes but forces design approaches that have incremental impacts on yield and/or configuration units (side by side units vs. stacked units).

The prototype triplex/quadplex project was used to illustrate impacts of these requirements. The design testing by Perkins&Will found that these requirements do not have measurable impacts for lots that have multiple street frontages or have alleys. The only impacts occur when looking at lots that are interior to the block with the single frontage. **Table 2** illustrates the impacts on a small project (4 units) of the design implications for providing rear or side parking for the project instead of in the front. A 4-unit project can be built using parking in the street frontage. This scenario is called "Front Access" in the table and produces a project that generates a development value more than the development cost (represented by the "return" total). Providing access and parking on the rear or the side of the building will reduce the number of units down to three.

The design impacts may also limit unit sizes to be able to fit the three units. Two alternatives were developed to illustrate this impact. MS Rear illustrates a design that works for a lot on a "main street" and SS Rear illustrates a design that works for a lot on a "side street." The result is two projects that have three units instead of four. The size of the building that can be built was the major driver of the two alternatives. Both scenarios result in one less unit but also slightly smaller average unit sizes. The resulting impact on financial feasibility is a negative return (value minus cost). The negative return is more pronounced on the MS Rear model as the negative return equates to 11 percent of total project cost. The negative return on the SS Rear model is 8 percent of total project cost. This reduction does not necessarily mean a 3-unit project on an interior lot is not feasible but is a less attractive program to develop and would require lower land costs to support development.

Table 2 Small Sized, Interior Lots Project Impacts

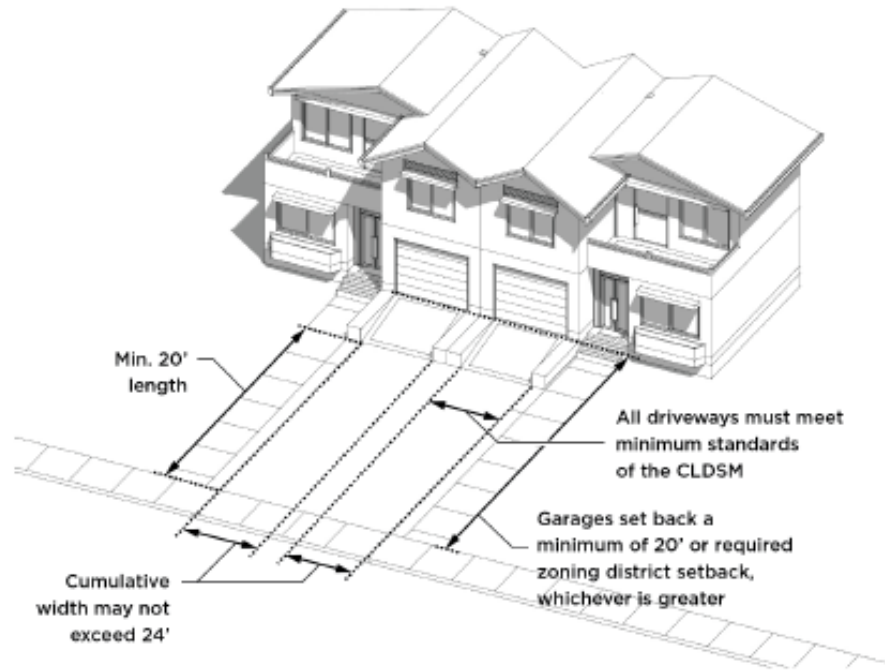
Description	Small Project		
	Front Access	MS Rear	SS Rear
Development Program			
<i>Residential</i>			
Units	4	3	3
Unit Size	2,000 Sq. Ft.	1,750 Sq. Ft.	1,900 Sq. Ft.
Sales Price per Square Foot	\$260	\$260	\$260
Sale Price per Unit	\$520,000	\$455,000	\$494,000
Gap and Return			
Development Value/Revenue	\$2,007,200	\$1,317,225	\$1,430,130
<i>Per Square Foot</i>	\$251	\$251	\$251
<i>Per Unit</i>	\$501,800	\$329,306	\$357,533
Development Cost	\$1,952,266	\$1,477,141	\$1,548,016
<i>Per Square Foot</i>	\$244	\$281	\$272
<i>Per Unit</i>	\$488,067	\$369,285	\$387,004
Return	\$54,934	(\$159,916)	(\$117,886)
<i>Per Square Foot</i>	\$7	(\$30)	(\$21)
<i>Per Unit</i>	\$13,734	(\$39,979)	(\$29,472)

Source: Economic & Planning Systems

Outcome

Updated – The 2nd Draft UDO provides greater flexibility for the provision of street access. In the 1st Draft UDO, a single access point as allowed for duplex through quadplexes. The 2nd Draft UDO allows for two access points if the cumulative width of the two access points does not exceed 24 feet, as illustrated in **Figure 4**. This change provides greater flexibility for accessing parking pads and garages for these middle density projects. The change has the most positive impact on duplexes as each unit can now have its own driveway access regardless of location of the lot. For triplexes and quadplexes, access to parking areas will have to be provided on the side or rear of the lot, which will present the same lot width challenges, but provides more flexibility in design and can reduce the potential for having to reduce the number of units in a building.

Figure 4 Duplex Split Front Access Diagram



3. Activity Centers/Neighborhood 2

There are three main issues related to Activity Centers/Neighborhood 2 place types identified during the process of evaluating the 1st and 2nd Draft UDO. A description of the issues and measurement of the impact are described below. In addition, several other considerations and clarifications were discussed. Notable considerations and clarifications are also provided.

Open Space and Green Area Requirements

Potential Issue

The 1st Draft UDO had a modified approach to the provision of open space and the preservation of trees and natural areas. The most significant change is the switch to the Green Area approach. The current regulations have requirements for open space through the Zoning Ordinance plus Tree Save requirements through the Tree Ordinance. The current Tree Save requirements require preservation of 10 to 15 percent of a site for trees. The 1st and 2nd Draft UDO requires that all sites save 15 percent of the development for tree save or provide a "Green Area" equivalent per the standards of the draft ordinance. The 1st and 2nd Drafts of the UDO, however, provide greater flexibility for what qualifies as a green area including the use of green walls, roof gardens/green roofs, donation of land, and high-quality areas (e.g., steep slopes, stream buffers, tree conservation area buffers). There continues to be fee-in-lieu options for urban areas, as well.

The 1st Draft UDO considers the two requirements, Green Area, and Open Space, to be additive. The general standard across most use types is a 10 percent requirement for Open Space and a 15 percent requirement for Green Area, which equals 25 percent of the site. There are limited opportunities in the 1st Draft UDO for overlap of the Green Area and Open Space requirements even though these areas can often serve the same purpose of tree/natural preservation and serving as usable open space.

The design of open space, specified in Table 16-1 of the 1st Draft UDO also stipulates that Open Space be a minimum length with 25 feet (for public and common open space). This requirement will impact project yield.

Reference: Open Space – 5.4, 9.4, 10.4, 11.4, 12.4, 16.4.B; Green Area – 29.5

Estimated Impact

The cumulative impact of the Open Space plus Tree Save requirements has impacts on the project design and the cost of the development. The design

analysis found that these requirements can be accommodated when exploring the prototype and actual site examples. However, in many cases the design required creative solutions and/or fee-in-lieu payments to be able to meet the standards. The resulting impact is the creation of green areas and open spaces that are often forced to inaccessible locations (e.g., roof tops), results in the loss of on-site preservation as the fee-in-lieu was utilized, and/or creation of green areas with limited value. In most cases, the fee-in-lieu option will be the least costly approach as the creation of green roofs or other solutions are likely cost prohibited. The estimated additional cost to the project was estimated to be between \$241,400 (0.3% of total project cost) to \$361,800 (0.5% of total project cost) using the Urban Multifamily prototype model.

The yield of development was not deemed to be measurably impacted (aside from the specified 25' by 25' requirement) in the 1st Draft, as the design analysis found most sites could accommodate the requirements using the flexibility options. The overall impact of the new Open Space and Green Area requirements is on project feasibility as increases in cost for creative solutions and/or the fee-in-lieu will occur and will be specific to the constraints to each site.

2nd Draft Changes

The 2nd Draft UDO provides even greater flexibility and overlap opportunities for required open spaces and green areas. In terms of required Open Space, the 2nd Draft UDO has removed the minimum width and length requirement of 25 feet and has incorporated a land dedication or fee-in-lieu option for open space requirements that provides much greater flexibility.

The places that Green Area can be accommodated has also become more flexible and can now overlap with other requirements in several ways. Substantive changes include removal of rights of ways and easements from that total site area used to calculate required Green Area, 50 percent of open space can now count towards required Green Area, specifically Tree Save Area, and lastly there are increased allowances for what counts as a Tree Save Area or Amenitized Tree Area including landscape yards, water quality buffers, storm water buffers, SWIM buffers, floodplain, and greenways and parks.

The allowance to overlap allowing for 50 percent of required tree save area with open space has the potential reduce the increased cost generated by the new open space and green area minimum requirements. The reduction of 50 percent of the Green Area within the prototype apartment model (same model used above in the review of this provision for the 1st Draft) reduced the added cost from \$241,400-\$361,800 to \$121,046-\$181,241 (which is 0.2% of total project cost).

Outcome

Updated – The 2nd Draft UDO provides additional flexibility for overlap of Green Area and Open Space as described above. Specifically, more allowances for Green Areas and Open Space to overlap and count towards the total requirements were

provided to produce better preservation solutions and open spaces. Lastly, the prescribed size of public and common open space was eliminated.

EV Charging Requirements

Potential Issue

A new requirement added within the 1st Draft UDO is the requirement to provide electric vehicle charging capabilities to parking lots and structures. The 1st Draft UDO defines three types of EV charging “stations;” EV capable, EV Ready, and EV Installed. Multifamily buildings, residential components of mixed-use buildings, hotels, and stand-alone parking structures must provide a portion of their required off-street parking spaces as either capable, ready, and installed. The requirements are triggered for any off-street parking that exceeds 9 spaces. For most lots (over 50 spaces) the requirement is for 20 percent of spaces to be EV capable, 10 percent to be EV ready, and 2 percent installed. For a parking area with 50 spaces, 10 spaces would have to be EV capable, 5 EV Ready, and 1 installed space.

Reference: Sub-section 19.3

Estimated Impact

The added requirement for EV charging stations (i.e., parking spaces) will increase the cost of development. Newer developments are in many cases choosing to provide access to EV charging to residents and tenants but often the number of spaces that are EV ready or capable is significantly less than what is required by the 1st Draft UDO.

The Real Estate and Building Industry Coalition (REBIC) in Charlotte provided estimates for the estimated cost to meet the new requirements for a standard multifamily apartment building with structured parking. It estimates that the added cost is \$6,400 per EV capable space. The most impactful cost it identified was tied to the electrical gear, conduit and wiring needed to make spaces capable, with additional cost related to make spaces EV Ready or fully installed. As a result, the most impactful part of the requirement is the amount of EV Capable spaces (cost to make spaces capable is estimated to be 70 to 80% of cost for a fully installed station), which may not be utilized.

EPS modeled the feasibility of a prototypical multifamily apartment building with structure parking. The prototype project has 280 residential units and 336 parking spaces. The EV requirements result in 108 EV capable, ready, or installed spaces. With the estimated increases in cost for the spaces, the average cost per space (for all spaces) in the project increased by \$2,000 per space. The added cost was approximately \$960,000 for the project, which as a 1.3 percent increase in the total project cost. The increased cost does not result in a project being infeasible but will reduce returns/value of the project for the developer or must be recouped

through increased rental rates. The increase in the rental rate is estimated to be \$21 per month per unit for the project to make project returns match.

One additional consideration is the sizing of power boxes. The increased electric power demands to accommodate all capable sites will require larger power boxes and as a result larger utility rooms for projects. This will impact project design and project cost however the extent of the increased size needed, and its impact was not estimated.

2nd Draft UDO Changes

The 2nd Draft UDO eliminated that requirement for 10 percent of spaces to be EV Ready. As a result, the required EV capable or installed spaces reduced from 32 percent to 22 percent, as shown in **Figure 5**.

Figure 5 2nd Draft UDO Required EV Charging Stations

Table 19-2: Required EV Charging Stations			
Total Number of Provided Off-Street Parking Spaces	EV-Capable Spaces	EV-Ready Spaces	EVSE-Installed Spaces
0-9 spaces	None	None	None
10-25 spaces	20% of spaces (rounded up)	40% of spaces (rounded up)	None
26-50 spaces	20% of spaces (rounded up)	40% of spaces (rounded up)	1 space
More than 50 spaces	20% of spaces (rounded up)	40% of spaces (rounded up)	2% of spaces (rounded up)

For the prototypical multifamily apartment building the number of spaces that are at least EV capable reduced from 101 spaces to 67 spaces. The resulting impact is a reduction in the added cost to the project from \$960,746 to \$660,513, which is 0.9 percent of total project cost (**Table 3**).

Table 3 EV Charging Requirement 1st and 2nd Draft Impacts

Description	Factor	1st Draft		2nd Draft	
		#	% of Total	#	% of Total
Project Total Spaces		336		336	
Electric Vehicle Spaces					
EV Capable Spaces	20%	67		67	
EV Ready Spaces	10%	34		0	
EV Installed Spaces	2%	<u>7</u>		<u>7</u>	
Total		108	32%	74	22%
Cost Inputs					
Cost per EV Installed Space		\$6,400		\$6,400	
Estimated Cost for EV Requirement		\$688,128		\$473,088	
Parking Cost without Requirement		\$9,072,000		\$9,072,000	
Cost per Space		\$27,000		\$27,000	
Parking Cost With Requirement		\$9,760,128		\$9,545,088	
Cost per Space		\$29,048		\$28,408	
Estimated Total Increase in Project Cost		\$960,746		\$660,513	
% of Total Project Cost		1.3%		0.9%	

Source: Economic & Planning Systems

Outcome

Updated – The requirements for EV stations reduced in the 2nd Draft UDO. The provision of electric charging spaces is a good policy that supports implementation of the Comprehensive Plan. The requirement still may be too high compared to actual demand. The recommendation is to revisit the requirement and consider reducing the amount of EV Capable spaces over time as the technology changes and the presence of electrical vehicles increases. The provision of EV charging spaces was also added to the development bonus table, which will result in additional height if EV charging facilities are provided beyond what is required by the ordinance, which can help address the increased cost impacts of the requirement.

Neighborhood 1 Height Transition

Potential Issue

Concerns were raised during the public review of the 1st Draft UDO that the height and intensity of development adjacent to Neighborhood 1 areas was too great and created negative impacts on existing, lower density neighborhoods. As a result, a change was made in the 2nd Draft UDO to introduce a height transition requirement for parcels adjacent to Neighborhood 1 Place Type areas. The new requirement restricts building height to 50 feet (i.e., four stories) from the lot line of a N1 parcel for the first 100'. Between 100 and 200 feet the height allowance increases to 65' (i.e., five stories), and then increases to the zoning district maximum allowed height after 200 feet. The 1st Draft UDO had a 65-foot limit for the first 200 feet. This new provision only changes the first 100 feet from the N1 lot line.

Reference: Multiple

Estimated Impact

The new provision in the 2nd Draft UDO will limit potential height of buildings in areas adjacent to Neighborhood 1 place types. EPS evaluated the frequency and magnitude of impact possible based on the draft language. EPS used the potential development sites (e.g., sites that are considered vacant, under-developed, or ripe for redevelopment) identified for the Community Viz model used to forecast growth in the city for the Charlotte 2040 Comprehensive Plan. The methodology to gauge the impact is described below.

Height Transition Evaluation Methodology

In total, there are 207,758 acres in the City of Charlotte and its Sphere of Influence. Approximately, 31 percent of these acres (65,661 acres) were coded as potential development sites. The potential development sites within the Neighborhood 1 place type were removed since they are not subject to this provision (or allow for development over 48 feet anyway). This reduced the number of acres potential subject to this provision to 31,105 acres.

EPS found 4,002 potential development parcels, totaling 16,588 acres, intersected the 100-foot buffer throughout the entire city. The average percentage of the parcel that overlapped with the buffer is 46 percent. However, the total area subject to the height restriction (i.e., within the 100-foot buffer) in these parcels totaled 2,980 acres, which is only 18 percent of the acreage in the parcels that intersect with the buffer.

Findings

The prototypical apartment building model was used to estimate impacts of the height reduction. For this prototypical apartment building, which is 5 stories in height, the project would experience an 8 percent reduction in the number of units from 280 to 256 units because of the lost story for the 100' buffer. This is a simple, conservative estimate that may overstate the impact as there are setback and landscape yard requirements that may limit the overlap of the building area with the 100-foot buffer. The loss of units does not make the project infeasible for the prototype project but does reduce the developer returns.

The Community Viz model estimated the build-out potential for multifamily units for each potential development parcel. The parcels that intersect the 100' buffer have an estimated buildout potential of 50,161 multifamily units. EPS estimated the potential reduction in capacity because of the height transition assuming; the loss of a story of height and density for the 100' buffer, and the percent of the parcel that is in the 100-foot buffer, and the estimated build out potential multifamily units on that parcel. EPS estimates that the capacity for multifamily units on these intersected parcels is reduced by 1,833 units (4% of total in impacted parcels). The impact is not deemed to significant at the aggregate city-wide scale and may be overstating the reduction in capacity.

4. Affordable Housing

There were four main recommendations the Affordable Housing group identified during the process of reviewing the 1st Draft UDO. These recommendations are for how the UDO – with modifications or through implementation/administration of the UDO – can help support affordable housing projects.

Zoning District Flexibility

One of the most consistent themes of the feedback gained from the Affordable Housing group was the need for flexibility related to standards and regulations for affordable projects. Many times, these projects are constrained by the financial tools and project qualification attributes needed for the project to obtain affordable housing financing/funding support. These rules often are the primary driver of design and project scale instead of zoning. As a result, the design standards that work for market rate projects may not be applicable to affordable projects. In addition, incentives such as greater density or height often are not useful for these affordable housing projects. The most impactful incentive identified is the flexibility of standards.

Updated – The 1st Draft UDO had one standard flexibility incentive in the draft for Neighborhood 1 under the Voluntary Mixed-Income Residential Development alternative (4.5B). Projects with a minimum portion of affordable housings (as specified in the UDO) are eligible for the use of the zoning standards for the zone district that is one step up in intensity/density. For example, a traditional single-family site in Charlotte is often zoned R-3, which translates to N1-A. An affordable housing development with N1-A zoning can use the standards for N1-B district if desired. A simple analysis of the potential number of units allowed on a one-acre site with this flexibility illustrates the bonus. Under N1-A, a parcel can fit 8 units (four sublots with a duplex on each lot). Under N1-B, the same one-acre site can fit 10 units (five sublots with a duplex on each lot). This increased density reduces the land cost per unit for the project by 20 percent. Currently, affordable housing developers often look for R-3 lots in the community with a large enough size that they can buy then rezone and develop using R-8. This practice helps to get a project's land cost to be lower since its reflective of R-3 density. This zoning district flexibility eliminates the need for the rezoning that can be continuous and expensive. Greater allowances for zoning district flexibility can generate even more value for affordable projects. For example, being able to go from N1-A to N1-C would increase the number of units from 8 to 14 in the simple duplex example. This increase in density reduces land costs per unit by 43 percent.

Allowing for greater flexibility of district use, specifically moving up two districts in intensity was considered for the 2nd Draft but was not provided.

While the Neighborhood 1 districts have the zoning category flexibility in the current draft, the same flexibility is not within the Neighborhood 2 or Mixed-use districts within the 1st Draft UDO. The design analysis identified the benefits of greater flexibility in design of allowing affordable housing projects to use other zone districts. For example, a site that is zoned NC will have more urban, built-to design standards that may be hard for an affordable housing apartment project to build under. If the same project is allowed to use N2-B instead, those design barriers are addressed. The recommendation coming out of the 1st Draft review was for the UDO to be revised to allow for affordable projects to have zone district flexibility in the Neighborhood 2 and mixed-use place types (e.g., RAC, CAC, and NC). The 2nd Draft UDO was modified to allow for greater flexibility of use within and between Neighborhood 2 and Neighborhood Center zoning districts. Specific changes include allowing N2-A zoned parcels to use N2-B standards, and parcels zoned N2-C or NC to be built using N2-A or N2-B standards.

Conservation Residential Development

Updated - As mentioned above in the Neighborhood 1 section, the Cluster Development alternative standards are a commonly used tactic for new single-family developments because of the lot size/dimension flexibility it provides projects. The 1st Draft UDO did not allow for projects using the Voluntary Mixed-Income Residential Development alternative to also use the similar Conservation Residential Development alternative standards as well. This limitation has been removed in the 2nd Draft UDO.

Fees in Lieu

Updated – Some of the development requirements within the 1st Draft UDO provided a fee in lieu or payment in lieu option for meeting the standard if the site is unable to accommodate the requirement. This option is available related to Green Area and tree preservation requirements in the First Draft UDO. A fee-in-lieu option for open space was added in the 2nd Draft UDO. A potential incentive for affordable housing projects identified in the outreach process was to allow these projects to take advantage of the flexibility the fee in lieu options to provide for design and then waiving the fees for qualifying projects. The 2nd Draft UDO provides the option to not pay the heritage tree mitigation fees if additional trees are planted on site above the standard requirements. Affordable projects are also allowed to use Tier 1 Green Area credits, which provides greater flexibility. Lastly, the 2nd Draft UDO also allows for projects to that are required to provide a new street to connect to abutting properties, but the connection does not yet existing on the abutting parcel, to dedicate and reserve the land for this connection but not have to build the street.

Height Bonuses for Affordable Units

Updated – The higher density zone districts have bonus menus for the provision of benefits in a project in the 1st Draft UDO. There are specific density and height bonuses for the inclusion of affordable housing. These bonuses are modeled after the approach used in the current TOD districts in the city. The bonus approach has not been successful in generating on-site affordable units but have been successful in generating fees-in-lieu that go to the affordable housing fund. Part of this is due to the design of these standards that make the fee-in-lieu option easier or the standards for achieving the bonus are not physically possible. Modifications have been made in the 2nd Draft UDO to provide a more enticing incentive structure for provision of on-site units. Changes were also made to create incentive tiers based on the level of affordability achieved through the bonus structure. Projects with units at affordable up to 60% of AMI have a more generous incentive bonus menu than projects that provide units at 80% of AMI. In addition, the requirements for receiving the bonus were simplified.

5. Employment

There was one main issue the Employment Focus Group identified during the process of reviewing the 1st Draft UDO. A description of the issue and measurement of the impact is described below.

Industrial Block Lengths

The 1st Draft UDO specifies the preferred and maximum block lengths allowed for each place type. The property line length and preferred block lengths are used to determine the number of blocks required to ensure site access and connections are provided based on the desired development pattern for that place type. The preferred block length of M&L is 800 feet with a maximum of 1,500 feet.

Reference: Sub-section 32.1.B.2

Estimated Impact

The building size of warehouse and distribution buildings has grown significantly over the past two decades driven by greater demand for these spaces and increased use of automation within the facilities. EPS evaluated several recently constructed industrial buildings and found building lengths from 1,000 to 1,700 feet to be common within newer projects. The Gibbons Street project example is 1,100 feet in length. The preferred and maximum block lengths listed for the M&L place type are smaller than many of the buildings being constructed currently and limit the ability and flexibility for locating large buildings within industrial parks.

Recommendation

Updated – The 2nd Draft UDO was modified to have the preferred block length in Manufacturing and Logistics place types to be 1,500 feet and the maximum length be 2,000 feet with an additional flexibility to accommodate unique projects.

6. Other Issues and Considerations

One other significant issue was identified in the process that may significantly impact development yield and feasibility.

Heritage Trees

The 1st Draft UDO includes a requirement for any heritage tree (defined as a tree native to North Carolina with a DBH of 30 inches or greater) to not be impacted unless certain conditions exist. If a tree needs to be moved, mitigation is required through replacement tree planting and mitigation payments. The intent of the ordinance is to protect the city's tree canopy, which has been diminishing. The impact of the new requirement is impossible to quantify on a citywide scale and difficult to document on a project specific setting through comparisons on built projects. Each development site will have widely varying impacts from heritage trees. It is likely that many of the actual sites evaluated –and sites in the City's inventory of vacant sites – will have heritage trees and will require mitigation. This requirement would have a significant impact on the development of these sites without additional flexibility for mitigation of the presence of Heritage Trees.

If known, the cost of replanting trees and paying mitigation payments can be navigated and accommodated in many cases. However, the needs of each site, particularly heavily wooded sites, are unknown without a tree survey. The cost of a tree survey will vary by site size and number of trees but is a necessary step in pre-development planning. In most cases, a developer is considering buying or developing a property prior to obtaining financing for the development project. The uncertainty of the cost of mitigating trees on a site will lead to developers passing on a site due to the upfront costs of understanding the magnitude of the potential impact. To address this issue, greater flexibility in the mitigation options and triggering for the allowance for mitigation is needed and can help (although not fully address) the impact.

Updated - The 2nd Draft UDO was modified to reduce the impact of the Heritage Tree provisions while trying to maintain the outcomes of tree preservation. The 2nd Draft now allows for removal of heritage trees if tree location(s) imposes a documented conflict on placement of a structure or the tree imposes an unreasonable restriction on the use of the property. The need to document heritage trees will increase the need to conduct tree surveys of properties and will increase cost (which was the case in 1st Draft). The need to mitigate removal of Heritage Trees will also increase cost. However, the provision is no longer likely to prevent development due to the requirement.

The intent of the ordinance is to protect the city's tree canopy, which has been diminishing. Each development site will have widely varying impacts from heritage

trees and other tree requirements. The changes to the 2nd Draft now provide options for mitigating impacts of Heritage Trees on properties, which addresses the primary concern of the provision. Also, more specific language was added regarding the impact of trees on adjacent properties to state that the critical root structure of a tree on an adjacent property does not require mitigation.